

Form PTO-1449		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY. DOCKET NO. 30-5000-(4015) Div. 2		PRIORITY SERIAL NO. 09/449,025	
LIST OF ART CITED BY APPLICANT (Use several sheets if necessary)				APPLICANT Shozo Nagano et al. #13			
				PRIORITY FILING DATE November 24, 1999		PRIORITY GROUP 1775	
U.S. PATENT DOCUMENTS							
*Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate	
2	AA	10/1999	Dubin et al.	1	1	10/24/99 09/78/233 10/24/99 09/78/233 10/24/99 09/78/233	
2	AB	02/1998	Gardner	1	1		
	AC						
	AD						
	AE						
FOREIGN PATENT DOCUMENTS							
	Document Number	Date	Country	Class	Subclass	Translation	
						Yes	No
	AF						
OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, Etc.)							
3	AG		Electromigration Properties of Copper-Zirconium alloy Interconnects, Y. Igarashi et al., <i>J. Vac. Sci. Technol. B</i> 16(5), Sept/Oct. 1998, p. 2745-2750.				
	AH		Directional and Preferential Sputtering-Based Physical Vapor Deposition, S.M. Rossnagel, 1995 Elsevier Science S.A., p. 1-12.				
	AI		Excellent Electro/Stress-Migration-Resistance Surface-Silicide Passivated Giant-Grain Cu-Mg alloy Interconnect Technology for Giga Scale Integration (GSI), T. Takewaki et al., 1995 IEEE, p. 95-253-95-256.				
	AJ		Materials Issues in Copper Interconnections, J.M.E. Harper, et al., <i>MRS Bulletin/August</i> 1994, p. 23-29.				
	AK		Preparation of Low Resistivity Cu-1 at. %Cr Thin Films by Magnetron, C. Cabral, Jr., et al., <i>Journal of the Institute of Metals</i> , June 1951, p. 185-208.				
2	AL		International Critical Tables of Numerical Data, Physics, Chemistry and Technology, National Research Council of the United States of America, Volumes I-VII, 1933, 6 pages.				
EXAMINER S. Jg				DATE CONSIDERED 7/1/02			
*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.							

Form PTO-1449

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICEATTY. DOCKET NO.
30-5000-(4015)-Div2SERIAL NO.
09/784,233LIST OF ART CITED BY APPLICANT
(Use several sheets if necessary)APPLICANT
Shozo Nagano et al.FILING DATE
February 14, 2001GROUP
Unknown 1742

U.S. PATENT DOCUMENTS

*Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
2	AA 6,113,781	09/05/00	Kardokus et al.	204	298.13	
3	AB 6,093,966	07/25/00	Venkatraman et al.	257	751	
	AC					
	AD					
	AE					
	AF					
	AG					
	AH					
	AI					
	AJ					
	AK					

FOREIGN PATENT DOCUMENTS

	Document Number	Date	Country	Class	Subclass	Translation	
						Yes	No
2	AL 01096376 A	14.04.89	Japan (ABSTRACT)	1	1		
3	AM 10287939	27.10.98	Japan (ABSTRACT)	1	1		
	AN						
	AO						
	AP						

OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, Etc.)

2	AR	Phillips et al., <i>The Effect of Certain Solute Elements on the Recrystallization of Copper</i> , 81 JOURNAL OF THE INSTITUTE OF METALS 185-208 (1953).
2	AS	ABSTRACT: Pierson et al., <i>Total sputtering yield of Ag/Cu alloys for low energy argon ions</i> , § 8 NUCL. INSTRUM. METHODS PHYS. RES. 108(3), pp. 290-9 (1986).
	AT	

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		APPLICANT Shozo Nagano et al.					
		FILING DATE February 14, 2001		GROUP Unknown			
LIST OF ART CITED BY APPLICANT (Use several sheets if necessary)							
U.S. PATENT DOCUMENTS							
*Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate	
A	AA 3,666,666	05/30/72	Haertling	252	62.9		
I	AB 3,923,675	12/02/75	Mazdiyasni et al.	252	62.9		
	AC 5,066,617	11/19/91	Tanemoto et al.	501	134		
C	AD 5,314,651	05/24/94	Kuhwicki	264	65		
	AE						
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FOREIGN PATENT DOCUMENTS							
	Document Number	Date	Country	Class	Subclass	Translation	
						Yes	No
E	AL 06081138 J	03.01.94	Watanabe et al. JP			Abstract	
E	AM 09249957 A	22.09.87	Watanabe et al. JP			Abstract	
	AN						
	AO						
	AP						
OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, Etc.)							
C	AR	Foster, Composition and Structure of Sputtered Films of Ferroelectric Niobates, 8 THE JOURNAL OF VACUUM SCIENCE AND TECHNOLOGY, No. 1,					
		pp. 251-255 (1971).					
C	AS	Haertling, Hot-Pressed Ferroelectric Lead Zirconate Titanate Ceramics for Electro-Optical Applications, 49 CERAMIC BULLETIN, No. 6,					
		pp. 564-567 (1970).					
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U.S. PATENT DOCUMENTS

Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
AA		3,963,934	08/15/76	Ormod	250	499	
AB		4,132,614	01/02/79	Cuomo et al.	204	192 EC	
AC		4,149,907	04/17/79	Wronski et al.	148	1.5	
AD		4,159,909	07/03/79	Wilson	75	170	
AE		4,198,283	04/15/80	Class et al.	204	298	
AF		4,209,375	06/24/80	Gates et al.	204	192 R	
AG		4,395,979	05/31/83	Pierce et al.	204	298	
AH		4,545,882	10/08/85	McKelvey	204	192 R	
AI		4,629,859	12/16/96	Reddy	219	121 LM	
AJ		4,814,053	03/21/89	Shimokawato	204	192.15	
AK		5,171,411	12/15/92	Hillendahl et al.	204	192.12	

FOREIGN PATENT DOCUMENTS

		Document Number	Date	Country	Class	Subclass	Translation	
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AL		EP 0 882 813 A1	09.12.98	Europe (Takahashi)				
AM		61084389 A2	28.04.86	Japan (Takewaki) - Abstract only				
AN		61113740 A2	31.05.86	Japan (Tanaka) - Abstract only				
AO		62127438	09.06.87	Japan (Tatsuta) - Abstract only				
AP		63033174	12.02.88	Japan (Kazuka) - Abstract only				

OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, Etc.)

AR		Dierckxens et al., <i>Effect of trace elements on the recrystallization behavior of high purity oxygen-containing copper</i> , ERZMETAL 28(11), 498-500 (1975). Abstract only.
AS		Lucke et al., <i>Physical Metallurgy Principles</i> , 5 ACTA MET. 298 (1957).
AT		Pierson et al., <i>Total sputtering yield of Ag/Cu alloys for low energy argon ions</i> , NUCL. INSTR. AND METH. IN PHYS. RES. 108 B, pp. 290-299 (1996). Full text of article submitted in abstract earlier.

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7/1/02

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Form PTO 1449 <div style="border: 2px solid black; border-radius: 50%; padding: 10px; display: inline-block; text-align: center;"> OTPE MAY 14 2001 PATENT & TRADEMARK OFFICE </div>		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY. DOCKET NO. 30-5000-(4015)-Div2		SERIAL NO. 09/784,233	
LIST OF ART CITED BY APPLICANT (Use several sheets if necessary)				APPLICANT Shozo Nagano et al.		FILING DATE February 14, 2001	
				GROUP Unknown 174			

U.S. PATENT DOCUMENTS							
*Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
7	AA	5,215,639	06/01/93	Boys	204	192.12	
	AB	5,242,566	09/07/93	Parker	204	298.2	
	AC	5,268,236	12/07/93	Dumont et al.	428	636	
	AD	5,282,943	02/01/94	Lannutti et al.	204	192.12	
	AE	5,282,946	02/01/94	Kinoshita et al.	204	298.13	
	AF	5,336,386	08/09/94	Marx et al.	204	298.12	
	AG	5,397,050	03/14/95	Mueller	228	193	
	AH	5,490,914	02/13/96	Hurwitt et al.	204	289.12	
	AI	5,589,040	12/31/96	Nishimura	204	192.26	
	AJ	5,674,367	10/07/97	Hunt et al.	204	298.12	
2	AK	5,693,203	12/02/97	Ohhashi et al.	240	298.12	

FOREIGN PATENT DOCUMENTS								
		Document Number	Date	Country	Class	Subclass	Translation	
							Yes	No
7	AL	63064211	22.03.88	Japan (Furukawa) - Abstract only				
	AM	63118033	23.05.88	Japan (Sumitomo Metal mining Co.) - Abstract only				
	AN	63235442 A2	30.09.88	Japan (Furukawa) - Abstract only				
	AO	1-96374	14.04.89	Japan				X
	AP	1-96376	14.04.89	Japan (Ishikura)			X	

OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, Etc.)			
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				APPLICANT Shozo Nagano et al. FILING DATE February 14, 2001 GROUP Unknown (74)				
U.S. PATENT DOCUMENTS								
Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate		
9	AA	5,772,858	06/30/98	Tepman	204	192.12		
	AB	5,833,823	11/10/98	Gruenenfelder et al.	204	298.09		
	AC	5,846,389	12/08/98	Levine et al.	204	192.1		
	AD	6,010,583	01/04/00	Annavarapu et al.	148	513		
	AE	6,028,003	02/22/00	Frise et al.	438	653		
	AF	6,039,855	03/21/00	Wollenberg	204	298.12		
	AG	6,042,752	03/28/00	Mitsui	252	520.1		
	AH	6,066,742	05/30/00	Daxinger et al.	204	298.09		
	AI	6,086,735	07/11/00	Gilman et al.	204	298.12		
	AJ	6,117,281	09/12/00	Novbakhlian	204	192.16		
	AK	6,121,685	09/19/00	Gardner	257	762		
	AL	6,139,701	10/31/00	Pavate et al.	204	192.17		
FOREIGN PATENT DOCUMENTS								
		Document Number	Date	Country	Class	Subclass	Translation	
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9	AM	02301585	13.12.90	Japan (Furukawa) - Abstract only				
	AN	05078195 A2	30.03.93	Japan (Sugiura) - Abstract only				
	AO	10-287939	27.10.98	Japan (Eguchi)			X	
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EXAMINER S.I.P				DATE CONSIDERED 2/1/02				
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Form PTO-1449 <div style="border: 1px solid black; border-radius: 50%; padding: 10px; display: inline-block; transform: rotate(-45deg); transform-origin: center;"> OFFICE MAY 14 2001 PATENT & TRADEMARK OFFICE </div>		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY. DOCKET NO. 30-5000-(4015)-Div2		SERIAL NO. 09/784,233	
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FILING DATE February 14, 2001				GROUP Unknown 1742			

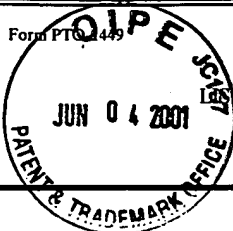
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*Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate	
	AA	09/556,488	Kardokus et al. (as filed)	1	1	04/21/2000	
	AB	09/815,474	Kardokus et al. (as filed and as amended)	1	1	07/13/2000	
	AC	09/714,714	Kardokus (as filed)	1	1	11/15/2000	
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FOREIGN PATENT DOCUMENTS							
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EXAMINER <div style="text-align: center; font-size: 1.5em;">S. Ip</div>	DATE CONSIDERED <div style="text-align: center; font-size: 1.5em;">7/1/02</div>
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09/784,233LIST OF ART CITED BY APPLICANT
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Shozo Nagano et. al.

#7

FILING DATE
February 14, 2001GROUP
1742

U.S. PATENT DOCUMENTS

*Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
	AA						
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FOREIGN PATENT DOCUMENTS

		Document Number	Date	Country	Class	Subclass	Translation	
							Yes	No
	AM							
	AN							
	AO							
	AP							
	AQ							

OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, Etc.)

B	AR		Brizzolara et. al., Low Energy Sputtering of Eutectic Ag/Cu Alloys, B26 NUCLEAR INSTRUMENTS AND METHODS IN PHYSICS
			RESEARCH 528-531 (1987).
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DATE CONSIDERED

7/1/02

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Form PTO-4449		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY. DOCKET NO. 30-5000-(4015)-Div2		SERIAL NO. 09/784,233		
LIST OF ART CITED BY APPLICANT (Use several sheets if necessary)				APPLICANT Shozo Nagano et al.				
				FILING DATE February 14, 2001		GROUP 1742		
U.S. PATENT DOCUMENTS								
*Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate	
<i>Q</i>	AA	5,023,698	06/11/91	Kobayashi et al.	357	67		
	AB	5,833,820	11/10/98	Dubin	204	212		
	AC	5,895,562	04/20/99	Dubin	205	137		
<i>Q</i>	AD	6,162,726	12/19/00	Dubin	438	678		
	AE							
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FOREIGN PATENT DOCUMENTS								
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<i>Q</i>	AL	0 335 383 A2	30.03.89	Europe (Kobayaashi et al.)				
	AM	0 626 722 A1	09.02.93	Europe (Ohmi)				
<i>Q</i>	AN	WO 00/73531 A2	07.12.00	WIPO (Kardokus et al.)				
	AO							
	AP							
OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, Etc.)								
<i>Q</i>	AR		Massalski, 18 BINARY ALLOY PHASE DIAGRAMS 18-19, 928-929, 936-937, 964-965 (1986).					
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Form PTO-1449		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY. DOCKET NO. 30-5000-(4015)-Div2		SERIAL NO. 09/784,233	
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3	AA	4,876,827	6-30-87	Hosoda et al.			
	AB	4,986,856	1-22-94	Tanigawa et al.			
	AC	5,077,005	12-31-91	Kato			
	AD	6,117,781	9-12-00	Lukanc et al.			
	AE	6,117,782	9-12-00	Lukanc et al.			
	AF	6,121,150	9-19-00	Avanzino et al.			
12	AG	6,197,433	3-6-01	Hatano			
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